

API-Cecom Group n'fo

Technical & Application Note A190

Application: Monitor steam condensate line

Type Of company: Public Utility

Location: Illinois

Problem: The customer is a public utility that uses coal to produce electricity. Coal comes into the plant via a belt from coal barges and/or the storage coal pile and travels to the boiler. The boiler heats water to create steam that flows into a turbine. At full load, the boilers can burn 380 tons of coal per hour. The turbine turns a shaft. On the end of the shaft is a magnet that revolves inside a coil to create electricity.

Note: For additional information on wastewater treatment see http://en.wikipedia.org/wiki/Electricity_generation

The engineer needs to monitor the steam condensate line to the boiler for oil and other contaminants. He has installed a turbidity sensor that outputs a 4-20 mA signal and needs to close a valve whenever the output from the sensor is above the nominal output that indicates oil or other contaminants in the condensate line to the boiler.

Solution: The customer selected a APD 1000 (DC Input, Single Setpoint Alarm) and a APD 4003 (Potentiometer to DC Transmitter). The APD 1000 has two failsafe relay outputs and it monitors the 4-20 mA output from the turbidity sensor. When the process is "safe", both relay outputs are energized and the process runs normally. When the output from the turbidity sensor exceeds the set-point, both relays de-energize bringing APD 4003 into the circuit in a unique way to shut off the valve. No input is necessary for the APD 4003 as one of the relays from the APD 1000 is connected to the APD 4003 contacts that allow remote activation of the APD 4003 output using the test output function. The other relay from the APD 1000 is used to switch in and out the connections between the output of the APD 4003, the process, and the valve. The output test function of the APD 4003 is preset to a 100% output. Whenever the turbidity sensor exceeds the safe level set by the engineer, the two relays of the APD 1000 trip, one switching the valve operation from the process to the output from the APD 4003. At the same time, the other relay of the APD 1000 activates the remote contact for the output test function on the APD 4003. Because the output test is set to 100% of the output, the valve is driven to the full closed position.



APD 1000

DC Input Single Alarm



APD 4003

Potentiometer to DC Transmitter



Photo by Tedder

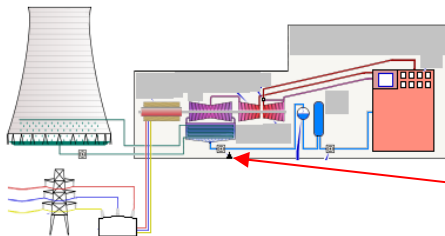
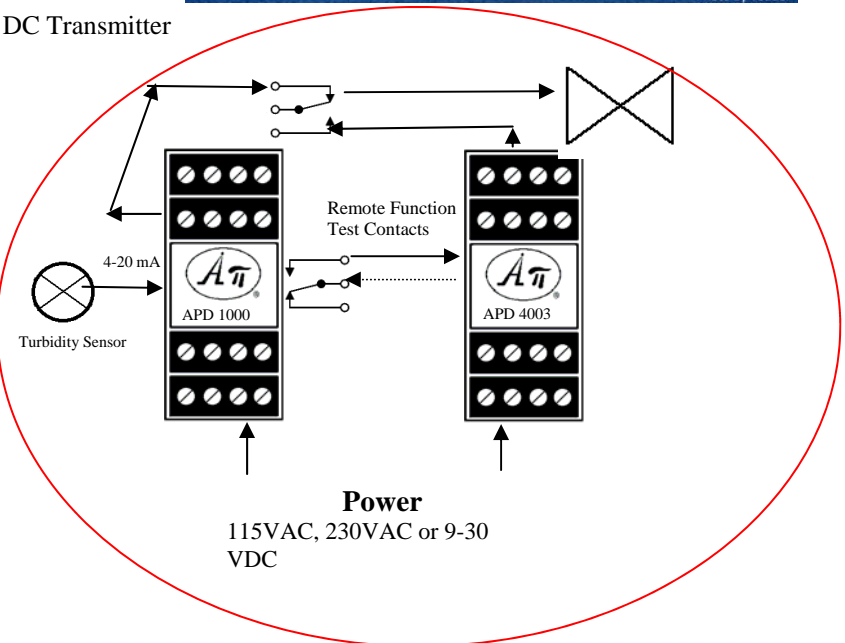


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